

Application No. 09/900,049
Reply to Office Action of April 27, 2004

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently Amended): A handoff method of performing a handoff when mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, said method comprising the steps of:

when detecting the start of a handoff, said previous foreign agent requests said new foreign agent to agent-advertise to said mobile terminal equipment;

when starting a handoff receiving an agent advertisement from said new foreign agent, the mobile terminal equipment additionally performing performs a regional registration of said mobile terminal equipment so as to doubly register said mobile terminal equipment so that said mobile terminal equipment is associated with both said previous foreign agent and said new foreign agent;

determining whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic when said mobile terminal equipment is doubly registered;

bicasting the IP packet to both said previous foreign agent and said new foreign agent if the IP packet is of real-time traffic, and buffering the IP packet if the IP packet is of non-real-time traffic;

~~when the handoff is completed, updating the regional registration associated with said previous foreign agent so that said mobile terminal equipment is associated only with said new foreign agent; and~~

when IP packets of non-real-time traffic are buffered, transferring the buffered IP packets of non-real-time traffic to said new foreign agent.

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Claim 2 (Original): The handoff method according to Claim 1, wherein in said double regional registration step, said mobile terminal equipment is registered with a home agent, and said home agent performs said IP packet determination step, said bicasting and buffering step, and said transferring step.

Claim 3 (Original): The handoff method according to Claim 2, wherein said home agent determines whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic based on information on a header of the IP packet.

Claim 4 (Original): The handoff method according to Claim 2, wherein said home agent determines whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic based on information on an upper layer, which is placed in a payload of the IP packet.

Claim 5 (Original): The handoff method according to Claim 1, wherein in said double regional registration step, said mobile terminal equipment is registered with a gateway foreign agent, and said gateway foreign agent performs said IP packet determination step, said bicasting and buffering step, and said transferring step.

Claim 6 (Original): The handoff method according to Claim 5, wherein said gateway foreign agent determines whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic based on information on a header of the IP packet.

Claim 7 (Original): The handoff method according to Claim 5, wherein said gateway foreign agent determines whether or not an IP packet destined for said mobile terminal

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equipment is of real-time traffic based on information on an upper layer, which is placed in a payload of the IP packet.

Claim 8 (Original): The handoff method according to Claim 1, wherein said mobile IP network is a cellular phone network in accordance with Radio Access Network standards which can perform a mobile IP procedure, said mobile terminal equipment is a cellular phone, and each of said new and the previous foreign agents is a radio network control unit that can give and receive an authority to control said cellular phone, as a handoff, according to an SRNC relocation procedure.

Claim 9 (Original): The handoff method according to Claim 8, wherein said radio network control unit piggybacks a mobile IP message onto a control message according to the SRNC relocation procedure.

Claim 10 (Original): The handoff method according to Claim 8, wherein said radio network control unit detects a start time and end time of the handoff according to an SRNC relocation procedure, and, when said cellular phone can establish communication according to mobile IP, notifies said cellular phone of the start time and end time of the handoff according to the mobile IP procedure.

Claim 11 (Original): The handoff method according to Claim 8, wherein said radio network control unit detects a start time and end time of the handoff according to an SRNC relocation procedure, and, when said cellular phone cannot establish communication according to mobile IP, notifies said cellular phone of the start time and end time of the

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handoff according to the SRNC relocation procedure, and autonomously performs a regional registration of said cellular phone or changes the regional registration.

Claim 12 (Original): The handoff method according to Claim 8, wherein after a plurality of radio network control units have accommodated said cellular phone, a previous one of the plurality of radio network control units assumes that an SRNC relocation procedure generated after a predetermined transfer of an authority to control the cellular phone is a handoff procedure, so as to detect the start time and end time of the handoff.

Claim 13 (Currently Amended): A handoff method of performing a handoff when mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, said method comprising the steps of:

when detecting the start of a handoff, said previous foreign agent requests said new foreign agent to agent-advertise to said mobile terminal equipment;

when receiving an agent advertisement from said new foreign agent, the mobile terminal equipment performs ~~when starting a handoff, additionally performing a regional~~ registration of said mobile terminal equipment with a home agent so as to doubly register said mobile terminal equipment so that said mobile terminal equipment is associated with both said previous foreign agent and said new foreign agent;

~~allowing determining by said home agent to determine whether or not an IP packet~~ destined for said mobile terminal equipment is of real-time traffic when said mobile terminal equipment is doubly registered;

~~allowing bicasting from said home agent to broadcast the IP packet to both said previous~~ foreign agent and said new foreign agent if the IP packet is of real-time traffic, and

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transferring the IP packet to said previous foreign agent if the IP packet is of non-real-time traffic;

~~allowing buffering at~~ said previous foreign agent ~~to buffer the~~ IP packet of non-real-time traffic transferred from said home agent therein;

when the handoff is completed, if IP packets of non-real-time traffic are buffered in said previous foreign agent, ~~allowing transferring~~ said previous foreign agent ~~to transfer the~~ buffered IP packets of non-real-time traffic to said new foreign agent; and

when the handoff is completed, updating the regional registration associated with said previous foreign agent so that said mobile terminal equipment is associated only with said new foreign agent.

Claim 14 (Currently Amended): An agent apparatus for transferring IP packets to a new foreign agent in a mobile IP network, to which mobile terminal equipment is moving, said apparatus comprising:

means for detecting the start of a handoff and for requesting said new foreign agent agent-advertise to said mobile terminal equipment;

means for performing a regional registration of said mobile terminal equipment by the mobile terminal equipment with a home agent, upon receiving an agent advertisement from said new foreign agent, so as to doubly register said mobile terminal equipment so that said mobile terminal equipment is associated with both said previous foreign agent and said new foreign agent

a means for, upon receiving an IP packet destined for said mobile terminal equipment when said mobile terminal equipment is doubly registered during a handoff, determining whether or not the IP packet is of real-time traffic;

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a means for bicastng the IP packet to both said previous foreign agent and said new foreign agent if the IP packet is of real-time traffic, and for buffering the IP packet if the IP packet is of non-real-time traffic;

a means for, when the handoff has been completed and IP packets of non-real-time traffic are buffered, transferring the buffered IP packets of non-real-time traffic to said new foreign agent.